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ABSTRACT

A major component of the creative problem solving process is divergent production, or the generation of alternative solutions to an open ended problem. Such solutions may be expressed in different forms or creative response styles: the verbal mode of expression involves stating solutions; the kinetic mode involves demonstrating solutions; and the integrative mode refers to simultaneously stating and demonstrating solutions. In an experiment with black preschool children, subjects from socioeconomically advantaged backgrounds tended to be more verbally creative, while those from disadvantaged backgrounds were more kinetically creative. The differences suggest that creative response styles may be affected by environmental influences, socialization, and schooling in different socioeconomic contexts. Systematic training in sociodrama (an integrative problem solving method) or in verbal problem solving appeared to enhance kinetic expressiveness but not verbal creativity, suggesting that at early stages of development, children are more able to express problem solutions through kinetic and integrative modes than through the verbal mode. Furthermore, the results indicate that creativity can be taught, and that deciding to train is more important than choosing between specific training approaches. (Author/MJL)

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Creative Response Styles

The Effects of Socioeconomic Status and Problem Solving Training

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Creative Response Styles:
The Effects of Socioeconomic Status and Problem Solving Training

Creative problem solving involves alternating divergent and convergent processes through which a problem is conceptualized and later evaluated for adequacy and quality (Torrance, 1979). These cognitive processes interact with the encoding and retrieval of information in memory as well as the memory code(s) on which knowledge is stored. The unique integration of various mental operations in creative problem solving taps different kinds of knowledge stored on different memory codes in both the left and right hemispheres of the brain. Therefore, information relevant to a problem may be processed using verbal-semantic, perceptual, and/or motor codes. Modes of expression used to communicate problem solutions also may or may not match the memory code(s) used for encoding and storage of information.

A major component of the creative problem solving process is divergent production, the generation of alternative solutions to an open-ended problem (Guilford, 1967). The modes of expression through which solutions are spontaneously generated in divergent production may be reflections of creative response styles. Stating problem solutions characterizes a <u>verbal</u> mode of expression. Demonstrating problem solutions defines a <u>kinetic</u> mode of expression. Simultaneously stating and demonstrating solutions to open-ended problems reflects an <u>integrative</u> mode of expression. An individual may use one or

more modes of expression in divergent production. Creative response styles can be classified in terms of preferences for verbal, kinetic, and/or integrative modes of expression.

A particular creative response style may reflect learned patterns of responding associated with environmental influences and/or the habituation of certain memory codes to one or both hemispheres of the brain. Additionally, creative response styles during early childhood may reflect level of cognitive development and life experiences. Thus, creative response styles may vary according to social class membership. They also may be affected differently by problem solving training methods emphasizing verbal or integrative (combination verbal-kinetic) modes of expression during early childhood, a sensitive period for the integration of language with action and imagery in the processing of information.

Socioeconomic Status

Socioeconomic status is one variable that has been associated with preferences for learning and creative expression. There is some evidence that children from middle and lower socioeconomic strata have different preferences, or strengths, for creative expression (Deutsch, 1967; Gallagher, 1975; Riessman, 1963; and Torrance, 1974; 1977). The term "advantaged" is often equated with middle class status while the term "disadvantaged" is often equated with lower class status in the literature. Advantaged children, who are traditionally achievement motivated, are characterized as preferring a verbal mode of expression because that is modeled and

reinforced through schooling and in the family. In fact, reliance on kinetic expression in communication may be specifically discouraged for the advantaged. Disadvantaged children are not as traditionally achievement motivated. They are characterized as preferring a kinetic mode of expression because it is more adaptive to environmental conditions. For example, lower class black children may be verbally inhibited and yet demonstrative in communication if the dialect spoken in the home is unacceptable at school. They may continue to exercise a kinetic preference developed early in life because structures for the use of that mode of expression have become well-formed. Kinetic expression of concepts may also be less likely to result in a negatively reinforcing outcome than attempts at verbal expression.

The racial composition of different socioeconomic strata often confounds the results of studies of socioeconomic status and creative problem solving (i.e. Houtz & Phillips, 1976; Kaltsounis, 1974; Khatena, 1971; Knox & Glover, 1978; Williams, Teubner, & Harlow, 1973). In such studies, the middle socioeconomic strata has been made up predominantly of whites while blacks have constituted the majority of lower socioeconomic samples. Furthermore, there has been little description of the creative problem solving performance of middle class blacks in studies of the advantaged. Middle class blacks might be expected to use the same mode of expression preferred by middle class white children--the verbal mode--if creative response style is the result of different environmental influences on members

of middle and lower socioeconomic strata. On the other hand, variance in creative response styles explained by socioeconomic differences might also be explained by a cultural factor if middle class blacks predominantly use a kinetic mode of expression as lower class blacks do. Therefore, one purpose of this study was to describe and compare the creative response styles used by middle and lower socioeconomic blacks in divergent production.

Learning Styles of Young Children

Modes of expression used in divergent production may also vary according to particular experiences in problem solving during sensitive periods of development. The late preoperational stage of development is considered a critical period for the integration of language with motor and imagery channels in learning (Bruner, 1964). Spontaneous creative expression, which occurs during the preoperational period in sociodramatic play, is characteristic of the natural developmental process (Piaget, 1955; Torrance & White, 1975). Sociodramatic play is the spontaneous acting out of fantasy and life roles by four to seven year olds in small groups. It is through the medium of play that young children achieve advancements in socialized language, including empathy for other points of view (Marsh, Serafica, & Baronboim, 1980), and in cognitive processing, such as the expression of information stored in memory in diverse schematic forms through verbal, kinetic, and integrative modalities (Bruner, 1964; Flavell, 1963).

The behavior of children engaged in sociodramatic play suggests that the learning styles of young children may include preferences for forming mental images and abstract concepts through verbalizing and acting out their understanding all at the same time (Dansky, 1980). This integrative mode of expression may be associated with an integrated verbal center, which Lenneberg (1967) describes as equally shared by both hemispheres of the brain before the age of five. This location of the verbal center early in life may be advantageous in providing simultaneous access to both hemispheres of the brain and a variety of schematic information stored on verbal-schematic, perceptual, and/or motor codes. The ability to make novel associations in creative production should be enhanced by the use of both verbal and non-verbal expressive modes (Bogen, et al., 1972; Parnes, 1977).

The late preoperational stage is a critical period for the development of verbal abilities (Bloom, 1964; Taylor, 1976) and also coincides with left hemispheric localization of the verbal center in the brain. One explanation of this phenomenon is that creative response styles are affected by early schooling and socialization since verbal ability becomes localized in a dominant left hemisphere for most right-handed children during the primary grades (Reynolds and Kaufman, 1980). The consequences of habituating one hemisphere alone to solving many types of problems is that useful information associated with the other hemisphere is not as likely to be activated in a problem solving task (Reynolds and Torrance, 1978). By the age of five, many children may have already developed a preference for using a single mode of expression on a problem solving task.

All children may not, however, spontaneously learn to integrate language with motor and perceptual modes of learning and expression used at earlier stages of development during sociodramatic play as suggested by Piaget (Smilansky, 1968). Early schooling and socialization may affect the creative response styles of the advantaged and disadvantaged differently. The disadvantaged, less likely than the advantaged to experience early schooling and home experiences which would reinforce confidence in using the verbal mode of expressing knowledge, and also, perhaps, more likely to have direct access to both hemispheres of the brain through the verbal center, may continue to exercise a kinetic preference or an integrative style. The latter result might be considered a creative strength since both hemispheres of the brain would likely be accessed in a problem solving task.

However, if the disadvantaged continue to prefer action for expressing information stored in memory, the integration of motor and perceptual learning with language might be inhibited. Also, information coded in motor and perceptual schemata may not be easily retrieved and communicated through a verbal mode of expression (Garrett, 1976; Sperry, 1974). If such difficulties in encoding or retrieval occur for the disadvantaged, they may rely on kinetic expression alone in creative problem solving. Thus, the creative response styles of the advantaged and disadvantaged may be affected differently by problem solving training methods emphasizing integrative (verbal-kinetic) and verbal modes of expression.

Problem Solving Training

While verbal deficiencies of the disadvantaged during the late preoperational stage have been explained in terms of a failure to adequately integrate language with action and imagery channels of learning in spontaneous sociodramatic play, Goor & Rapoport (1977), Khatena (1971), Smilansky (1968), Torrance (1972), and others have held that children can be taught to integrate different learning and expressive modalities during guided sociodramatic play. What problem solving training methods should be most effective in teaching children to express problem solutions through verbal, kinetic, and integrative modalities? Feasible strategies should have the potential to enhance emotional involvement, the development of empathy for other points of view, and the interaction of the left and right hemispheres in problem solving. They should emphasize the use of different modalities throughout the creative problem solving process. These factors are needed for high levels of creative production.

Sociodrama, an integrative method which combines verbal and kinetic modes of problem solving, should be well matched to the learning styles of young children and to the disadvantaged in particular, who are active learners (Saltz, Dixon, & Johnson, 1978; Torrance, 1975). Sociodrama should not only strengthen individual preferences for creative expression but also contribute to the development of less dominant modes of responding. The creative expression of the advantaged and the disadvantaged should be equally enhanced by this integrative method. Sociodrama should strengthen

a kinetic preference for the disadvantaged and develop or integrate this mode of expression with the verbal mode; it could have a comparable effect on the advantaged by strengthening a verbal preference and developing or integrating this mode of expression with the kinetic mode.

A verbal method emphasizing the human relations skills of problem exploration and understanding may be another feasible strategy. Such training may enable the young child to construct access to a variety of schematic information which can be expressed verbally. Such a direct training approach is supported by the fact that even early school success is highly dependent upon the use of the verbal mode in learning.

In summary, the major purpose of this study was to determine the effects of socioeconomic status and problem solving training methods on the creative response styles of young black children. Specifically, three questions were addressed: (1) Do advantaged and disadvantaged black children have different creative response styles? (2) Can the creative response styles of young black children be developed or enhanced by problem solving training? (3) Do sociodrama and verbal problem solving methods affect the creative response styles of advantaged and disadvantaged young children differently?

Method

Sample

The initial sample consisted of 89 black children stratified into two levels of socioeconomic status. The "advantaged" sample included 47 children enrolled in the kindergarten classes of a private day care center in a predominantly black middle class neighborhood of a southern urban area. The "disadvantaged" sample consisted of 42 children of welfare families attending a federally funded child development center located in a housing project in the same city. The male-female ratio in each group was comparable. The appropriateness of subjects' assignment to advantaged and disadvantaged categories was verified according to variables which distinguish lower and middle socioeconomic strata (type of parental employment, marital status of parents, rate of absenteeism, and cost of preschool education) before inclusion in the sample. Attrition due to relocation, excessive absenteeism, and an inability to respond to experimental tasks due to severe behavioral and speech disorders reduced the sample to 79 with equal losses in the two socioeconomic groups. The age range of the advantaged group was four and one-half to six years with a mean age of five years. six months. The age range of the disadvantaged group was five years, zero months to six years, zero months with a mean age of five years, four months.

Training Procedure

After separate random assignment of advantaged and disadvantaged children to three problem solving training conditions, two subgroups

of children at each preschool center were instructed by the author in the use of sociodrama, an integrative problem solving method, or a verbal method based on a human relations model in 40-minute daily sessions. Control groups, which participated in the traditional programs at their respective schools and received no special problem solving instruction, constituted the third problem solving condition. All creativity data were gathered at the end of a six-week intervention period.

Both group problem solving training methods matched the learning styles of preschool children generally and the disadvantaged in particular in three ways. Both methods emphasized emotional identification with children confronted with an unresolved problem, much like the ones children in the late preoperational stage of development typically encounter with peers, parents, and other authority figures. Both methods also induced the use of imagery through the generation of a context for solving social and family-related conflicts. Finally, both methods involved the interaction of semantic and episodic memory in the problem solving process, increasing the likelihood of relating diverse schematic information in both hemispheres of the brain in new ways.

Sociodrama. The integrative method based on sociodrama required the use of verbal and kinetic modes of expression separately and in combination. This procedure combined role playing and dramatic enactment to solve conflicts of protagonists in familiar fairy tales and stories about typical problems children face. Conflicts were

actively experienced in a group setting by subjects acting out roles to define the problem in context, generating better ways for the protagonist to solve the problem at hand, and refining solutions through guided improvisational enactment. Torrance's (1975) eight step procedure for using sociodrama as a creative problem solving process was followed: (1) problem exploration, (2) the specification of a conflict to be resolved, (3) the casting of characters, (4) the warm-up, (5) the action phase, (6) the change of sociodrama techniques or actors in mid-action or at the logical end of an episode, (7) evaluation, and (8) recycling. Divergent production and original thinking, the first stage of creative problem solving in McMullin's (1977) conceptualization of the creative process, were heavily emphasized in this set of procedures. The procedures for conducting sociodrama with young children are identical to the procedures described in Haley (1978).

Verbal training method. The verbal method based on a human relations model required the use of the verbal expressive mode alone in problem solving. Training was based on the exploration-understanding-action paradigm of the Carkhuff helping model where skills were developed in attending, observing, listening and responding. Verbal expression was used to describe physical attributes and behaviors, to infer emotional states, and to summarize the gist of a conflict presented by another child in the group telling about a personally relevant experience. Convergent production abilities, the second

state of creative problem solving in McMullins's (1977) model, were emphasized in the solution of life-relevant problems (Houtz & Phillips, 1976). Problem solving strategies were adapted from the Trainer's guide: The art of helping (Carkhuff & Pierce, 1975). The procedures for training young children to use verbal expression in interpersonal problem solving are identical to the procedures described in Haley (1978).

Dependent Measures

Divergent production is a major component of the creative problem solving process. It is the generation of alternative solutions to an open-ended problem through verbal, kinetic, and/or integrative modes of expression. Verbal expression is the stating of problem solutions; kinetic expression is the demonstration of solutions; and integrative expression is the simultaneous verbalization and demonstration of solutions. When spontaneously used to generate alternative solutions to open-ended problems, these modes of expression are considered preferences, or creative response styles.

Each subject spontaneously used one or more of these three modes of expression to generate alternative solutions to three open-ended problems on the Torrance (1977) Thinking Creatively in Action and Movement Test (TCAM). One test task (What other ways?) was used as a warm-up activity and was not scored. Responses to two other problems (How many ways? and What might it be?) were first categorized as verbal, kinetic, or integrative expressive modes and then scored for fluency and originality using standard scoring procedures. Subjects were tested individually.

Fluency and originality represented quantitative and qualitative measures of divergent production. Fluency was defined as the number of "different, relevant, and adequate responses" to the open-ended problems on the Torrance test. It served as a quantitative measure of divergent production. Originality was scored according to the degree of uniqueness of subjects' responses or solutions to the same open-ended problems. It was a qualitative measure of divergent production, with each solution scored on an interval scale (0, 1, 2, or 3) on the basis of the statistical infrequency of that solution when compared to a list of solutions generated for each test problem by a normative sample. A score of zero was recorded for all solutions which were generated by 10% or more of the respondents in the TCAM norm group. Weights of 1, 2, and 3 points were assigend respectively to solutions given by 5-9%, 2-4%, and less than 2% of the normative sample. Inter-rater reliability was .99 for scoring fluency and .97 for scoring originality.

Analysis of the Data

Fluency and originality measures of divergent production were analyzed separately in each of the three modes of expression (verbal, kinetic, integrative) in which the spontaneous generation of solutions to open-ended problems on the TCAM were recorded using ANOVA procedures. The experimental factors in the 2 X 3 factorial designs were socio-economic status (advantaged, disadvantaged) and problem solving training condition (sociodrama, verbal method, control).

Fluency and originality were treated independently in statistical analysis although it has been determined that originality is a function of fluency (Hocevar, 1979; Milgram & Arad, 1981; Milgram, et al., 1978). It can be argued, however, that the scoring of solutions lacking in uniqueness as zero removes the effect of fluency on the originality of problem solutions. Analysis of covariance of fluency on the originality scores was, therefore, not warranted.

The assumption of homogeneity of variance was found to be untenable when analysis of variance was conducted on the fluency and originality raw scores in each of the three modes of expression. A great deal of variability occurred within factorial cells as a result of individual differences not only in the quantity and quality of solutions but also in the frequency of use of the three modes of expression within subjects. To illustrate, some subjects received very high fluency and/or originality scores in one mode of expression used almost exclusively in divergent production while other subjects in the same cell had zero or near zero scores in that mode (and possibly very high fluency and/or originality scores in a different mode). Therefore, analysis of variance for each dependent measure was rerun after transforming each raw score to a proportion of the total sum of scores across all three modes of expression in each factorial cell. This transformation, based on the formula $\emptyset = 2 \arcsin \sqrt{p}$, creates an approximately normal distribution because all proportions are based on the same N and each angle in the transformation has the same variance, 1/N (Walker & Lev, 1953).

Results

The effects of socioeconomic status and problem solving training conditions on creative response styles were examined by a 2 (advantaged, disadvantaged) X 3 (sociodrama, verbal method, control) analysis of variance of fluency and originality scores in verbal, kinetic, and integrative modes of expression. Data analysis and results are organized around the first two questions addressed in this study. The interaction effects, which addressed the third question, were nonsignificant. Analysis of variance results are displayed in Table 3.

Socioeconomic Status

1. Do advantaged and disadvantaged black children have different creative response styles? Mean fluency and originality scores* of the advantaged and disadvantaged are presented separately for verbal, kinetic, and integrative modes of expression in Table 1. Fluency in all three modes and originality in verbal and kinetic modes of expressing solutions to open-ended problems on the TCAM were affected by socioeconomic status. Analysis of variance results revealed significant main effects of socioeconomic status on verbal fluency, $F(1,73) = 4.06$, $p < .05$, and originality, $F(1,73) = 6.19$, $p < .05$; kinetic fluency, $F(1,73) = 12.88$, $p < .001$, and originality, $F(1,73) = 14.45$, $p < .001$; and integrative fluency, $F(1,73) = 5.72$, $p < .05$.

Insert Table 1 About Here

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*based on arcsin transformations of the raw data

The quantity and quality of problem solutions was significantly greater for the advantaged (M = .1448 and .1475 for fluency and originality respectively) than for the disadvantaged (M = .1135 and .0957 for fluency and originality respectively) when subjects spontaneously used a verbal mode of expression. Conversely, the quantity and quality of solutions was significantly greater for the disadvantaged (M = .1421 and .1391 for fluency and originality respectively) than for the advantaged (M = .0918 and .0791 for fluency and originality respectively) when a kinetic mode of expression was spontaneously used. The proportion of solutions generated in the integrative mode of expression compared to total fluency scores was also significantly greater for the disadvantaged (M = .0882) than for the advantaged (M = .0645). However, there was not a comparable significant result for the originality of problem solutions generated in the integrative mode.

Consideration of the amount of variance accounted for by this variable is instructive. The magnitude of the effect of socioeconomic status on the quantity and quality of problem solutions generated was small for the verbal and integrative modes but moderate for the kinetic mode of expression. Eta coefficients squared were only .05 and .08 for verbal fluency and originality and .07 for integrative fluency. However, 15 and 17% of the variance in kinetic fluency and originality respectively was explained by the socioeconomic status factor.

Insert Table 3 About Here

Problem Solving Training

2. Can the creative response styles of young children be developed or enhanced by problem solving training? Mean fluency and originality scores* of the sociodrama, verbal method, and control problem solving groups are presented separately for verbal, kinetic, and integrative modes of expression in Table 2. Fluency and originality in kinetic and integrative modes of expression of solutions to open-ended problems on the TCAM were affected by problem solving training. There was a significant training effect on kinetic fluency, $F(2,73) = 4.691$, $p < .01$, and originality, $F(2,73) = 6.517$, $p < .01$; and integrative fluency, $F(2,73) = 8.861$, $p < .001$, and originality, $F(2,73) = 13.397$, $p < .001$. The quantity and quality of problem solutions generated in a verbal mode were not affected by problem solving training.

Insert Table 2 About Here

Follow-up analyses of the problem solving training effect were conducted using Duncan's multiple-range tests. These analyses revealed that (1) both the sociodrama and verbal methods positively affected kinetic fluency and originality, and (2) only the sociodrama method positively affected integrative fluency and originality. The

*based on arcsin transformations with the raw data

proportion of solutions generated in the kinetic mode compared to total fluency scores was significantly greater for the sociodrama (M = .1316) and the verbal method (M = .1270) compared to the control group (M = .0868). The proportion of total originality points earned for solutions generated through a kinetic mode was, likewise, greater for subjects in the sociodrama (M = .1301) and verbal method (M = .1220) groups compared to a no-training control (M = .0687). However, the proportion of solutions generated in the integrative mode was significantly greater for subjects trained in sociodrama (M = .1064) compared to the verbal method (M = .0540) and the control group (M = .0654). A comparable effect was obtained for the proportion of originality points earned for solutions generated through the integrative mode. The proportion was higher for the subjects trained in sociodrama (M = .1099) compared to the verbal method (M = .0413) and control group (M = .0465).

Again, the amount of variance accounted for is instructive. The effect size was larger for the problem solving training factor than for the socioeconomic status factor on the fluency and originality of problem solutions generated. Eta coefficients squared were .114 and .152 for kinetic fluency and originality respectively and .195 and .268 for integrative fluency and originality respectively.

Discussion

The first question addressed in this study was, Do advantaged and disadvantaged black children have different creative response

styles? The findings related to the effects of socioeconomic status on creative response styles are significant in three ways. One conclusion is that the differences between the advantaged and disadvantaged are a function of creative response style rather than a substantial difference in overall ideational fluency and originality in divergent production. The obtained differences in creativity expressed through verbal and kinetic modes are consistent with the results of earlier socioeconomic studies: lower socioeconomic status subjects were more kinetically creative while middle class subjects were more verbally creative. However, the results of the present study were not confounded by race since all subjects were black. Additionally, the result obtained for creativity expressed through the integrative mode--that the disadvantaged generated a larger number of solutions through the simultaneous use of verbal and kinetic expression even though they did not generate qualitatively better (more original) solutions through the integrative mode--has not previously been presented in the literature.

Secondly, the finding of socioeconomic differences in the creative response styles of an all black sample is also significant. Middle class black children were more successful in creative problem solving using a verbal mode of expression. This is consistent with the findings of studies of white affluent children. This result suggests that creative response style may be a function of different environmental influences, such as early socialization and schooling, on members of lower and middle socioeconomic strata without regard

to race. This conclusion is tentative, of course, until other creativity studies are conducted with racial balance within lower and middle socioeconomic strata.

Finally, the finding that the advantaged and disadvantaged were more successful in creative problem solving in different expressive modalities also has implications for the potential impact of environmental influences on hemisphericity and certain mental operations. The preference of the advantaged for verbal expression at the age of five lends support to earlier research which suggests that traditional schooling influences the localization of the verbal center in the left hemisphere of the brain. The advantaged may have learned not to use kinetic and integrative modes of expression with a consequent loss of access to the right hemisphere for the generation of alternative solutions on problem solving tasks. The disadvantaged. less traditionally schooled at the age of five, may retain creative strengths in the use of kinetic and integrative modes of expression. Such strengths may be the result of better access to the right hemisphere of the brain where the verbal center may still be partially localized. Given the emphasis on the verbal mode in school learning, the creative advantage of the disadvantaged will likely be short-lived, even if such is the case.

Other findings address the question, Can the creative response styles of young children be developed or enhanced by problem solving training? There are two major conclusions: (1) creativity can be

taught, and (2) the method of training has some differential effects on the quantity and quality of solutions generated in different expressive modalities.

An interesting result was that both the sociodrama and verbal problem solving methods positively affected kinetic fluency and originality. This finding suggests that systematic problem solving training may be more important than its specific approach during early childhood for strengthening an existing preference. Verbal creativity was not significantly enhanced or developed by either method. This result may be related to the degree to which language has been integrated with action and imagery in problem solving at this stage of development. It is also possible that the encoding of verbal information is enhanced by problem solving training, but young children more creatively express problem solutions through a kinetic or integrative mode.

Another significant finding was that sociodrama training alone affected creativity in the integrative mode of expression. Sociodrama may impact memory structure such that the ability to make novel associations in creative problem solving is enhanced by the use of both verbal and kinetic modes of expression. Further, the generation of more and better problem solutions in the integrative mode as a result of sociodrama training may also be related to better access to both the left and right hemispheres of the brain.

The development of creativity in the integrative mode as a result of sociodrama experiences can also be explained as a direct training

effect. The children trained in sociodrama did solve problems through an integrative mode in role playing and dramatic enactment with a corresponding emphasis on components of the divergent thinking processes. This was not a characteristic of the verbal method, which emphasized convergent thinking skills. This result supports the use of sociodrama for the development of creative problem solving abilities. The use of physical and verbal activity in the group problem solving process seems to match the developmental level of preoperational stage children who are using action, imagery, and language simultaneously in problem solving.

The third question addressed in this study was: Do sociodrama and verbal problem solving methods affect creative response styles of the advantaged and disadvantaged differently? There was not a significant interaction effect on fluency and originality in any mode of expression. Neither problem solving training method better matched the learning styles of the advantaged or disadvantaged. This finding suggests that level of development is perhaps a more significant determinant of creative response styles than socioeconomic status per se. Further, problem solving training, regardless of the specific approach, may provide the necessary experience to strengthen existing preferences for creative expression which are developmentally influenced.

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Table 1

Comparisons of the Advantaged and Disadvantaged on Fluency and Originality in Verbal, Kinetic, and Integrative Modes of Expression

	Fluency		Originality	
	M	SD	M	SD
		Verbal Mode		
Advantaged	.1448	.0759	.1475	.1073
Disadvantaged	.1135	.0581	.0957	.0671
		Kinetic Mode		
Advantaged	.0918	.0633	.0791	.0682
Disadvantaged	.1421	.0731	.1391	.0890
		Integrative Mode		
Advantaged	.0645	.0516	.0592	.0598
Disadvantaged	.0882	.0612	.0748	.0717

Note. Means and standard deviations are proportions based on arcsin transformations of the raw data and the calculation of Ø. Advantaged (n = 42); Disadvantaged (n = 37).

Table 2

Comparisons of Problem Solving Training Conditions on Fluency and Originality in Verbal, Kinetic, and Integrative Modes of Expression

	Fluency		Originality	
	M	SD	M	SD
Verbal Mode				
Sociodrama	.1411	.0802	.1487	.1102
Verbal Method	.1416	.0722	.1341	.0952
Control	.1072	.0485	.0861	.0593
Kinetic Mode				
Sociodrama	.1316	.0718	.1301	.0868
Verbal Method	.1270	.0779	.1220	.0900
Control	.0868	.0597	.0687	.0601
Integrative Mode				
Sociodrama	.1064	.0718	.1099	.0840
Verbal Method	.0540	.0410	.0413	.0447
Control	.0654	.0394	.0465	.0319

Note. Means and standard deviations are proportions based on arcsin transformations of the raw data and the calculation of Ø. Sociodrama ($n = 27$); Verbal Method ($n = 26$); Control ($n = 26$).

Table 3

Analysis of Variance of Fluency and Originality by Socioeconomic Status and Problem Solving Training

	Fluency				Originality			
Source	SS	df	F	η^2	SS	df	F	η^2
				Verbal Mode				
Socioeconomic States	.018	1	4.056*	.053	.047	1	6.192*	.078
Problem Solving Training	.017	2	1.962		.045	2	2.981	
Interaction	.020	2	2.317		.033	2	2.204	
Residual	.319	73			.550	73		
				Kinetic Mode				
Socioeconomic Status	.054	1	12.878***	.150	.078	1	14.453***	.165
Problem Solving Training	.040	2	4.691**	.114	.071	2	6.517**	.152
Interaction	.012	2	1.395		.015	2	1.340	
Residual	.308	73			.396	73		
				Integrative Mode				
Socioeconomic Status	.015	1	5.720*	.073	.009	1	2.694	
Problem Solving Training	.047	2	8.861***	.195	.088	2	13.397***	.268
Interaction	.007	2	1.300		.011	2	1.670	
Residual	.193	73			.239	73		

*p<.05 ** p <.01 ***p <.001